Yukon Flats Workshop

Improving Wildfire Management Decision-making

April 2021

In 2021, the U.S. Fish and Wildlife Service hosted a virtual 3-day workshop to explore the changing environment and potential changes in fire management for the Yukon Flats National Wildlife Refuge. Researchers, fire managers, biologists, ecologists, land managers, and smoke and health specialists were invited to participate. Sixteen presenters and 40 participants representing state, federal, and tribal agencies convened for the workshop. This effort was facilitated by the Alaska Fire Science Consortium and Alaska Conservation Foundation.

Beginning the Conversation

Starting a meaningful dialogue requires a common understanding of climate change projections, wildfire occurrence and effects, modeling tools, and fire management practices. Researchers developed tailored analyses, maps, and figures. These place-based products helped with understanding the unique geography of the Yukon Flats. Examples included wildfire reburn analyses, regional climate projections, models of permafrost dynamics, and a summary of available data layers.

Workshop Goals

Improve land management practices within the refuge by providing an open forum to discuss how wildfire in a changing climate affects:

- -Human health
- -Carbon storage
- -Vegetation
- -Permafrost

Human Health

Residents of Interior Alaska experience more wildfire smoke than other Alaskans. Cumulative short-term exposures (over multiple days or weeks) have been associated with reduced lung function and increased susceptibility to respiratory infections. Residents can minimize impacts by remaining indoors during smoke events and preventing smoke from entering the home.

For workshop recordings and resources visit: www.frames.gov/event/574183

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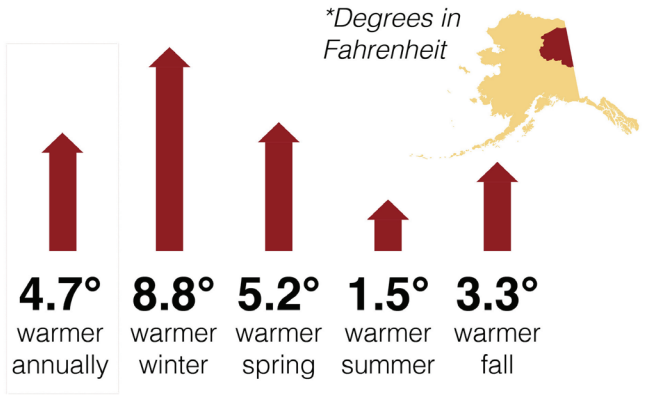
Climate

The Yukon Flats has warmed nearly 5°F since 1950 with winter warming almost 9°F. Temperatures are expected to continue to rise dramatically. Precipitation may increase in the next 30-50 years but rapid drying from increasing temperatures is likely to overshadow precipitation's effect on wildfire fuels.

Permafrost

Yukon Flats contains shallow permafrost as well as unique, high-carbon, deep deposits. There is more carbon in permafrost than exists in the atmosphere today. Thawing permafrost alters the landscape at small and large scales and accelerates greenhouse gas emissions. Projected warming and increasing wildfires will likely lead to rapid loss of permafrost, and changes in vegetation.

Every season is warmer on Yukon Flats



Credit: Thoman, R. (2021). Every season is warmer. *Yukon Flats Changing Environment*, H. R. McFarland, editor. uaf-iarc.org/yukon-flats-changes.
Data source: ERA5 courtesy of ECMWF/Copernicus

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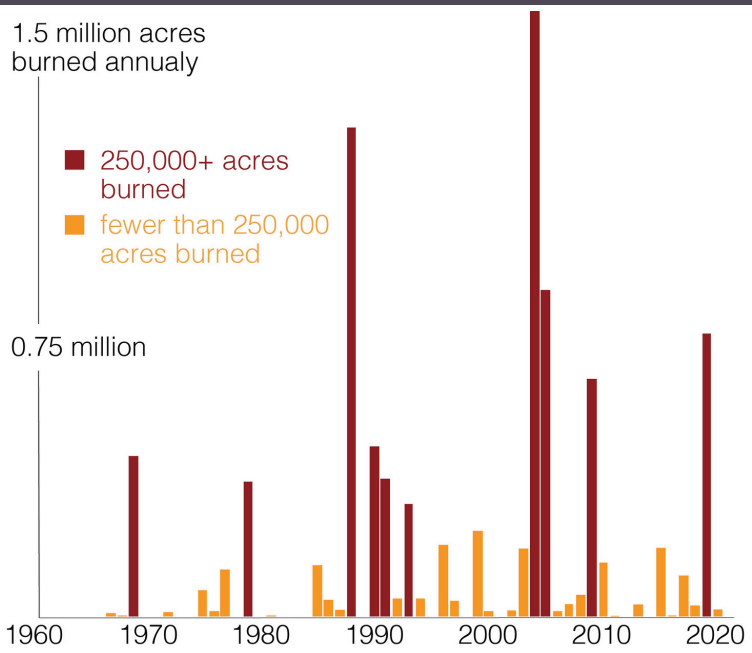

Wildfire

In the past 60 years, wildfire in the Yukon Flats refuge has burned over 8 million acres and touched nearly 65% of the refuge at least once. Over the past 30 years, more frequent, large fire seasons (>250,000 acre) have occurred.

One of the goals of the workshop was to better understand how resources and ecosystem processes are affected by fire and, in turn, affect future wildfires. How these processes are changing under a warming climate, and how this relates to desired future conditions and management approaches are complex topics that were explored during the workshop.

Summary

For several decades most wildfires have been monitored with no suppression unless approaching private lands. Current and projected increases in the occurrence and size of fires will lead to degradation of permafrost, increases in greenhouse gas emissions, and increases in threat to human health. The USFWS is considering these impacts and is exploring ways to adapt fire management to this unfolding reality with input from scientists and local managers.

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